

# A REVISION OF THE HYDROID GENUS *PERIGONIMUS*

M. SARS, 1846

By WILLIAM J. REES

## SYNOPSIS

During the past century nearly forty hydroids have been referred at one time or another to the genus *Perigonimus* M. Sars. The type species was demonstrated to be a *Bougainvillia* in 1938, and the status of all the other "*Perigonimus*" spp. is now considered and their position determined in accord with modern ideas on classification. They are distributed between the Orders Anthomedusae (Athezata), Leptomedusae (Thecata) and Limnomedusae, the majority being referred to four families of the first-mentioned Order.

Some material of *Perigonimus vestitus*, determined by Allman, has been re-discovered in the British Museum and is found to belong to *Leuckartiara octona* (Fleming). The original drawings of Joshua Alder's *Perigonimus linearis*, also in the Museum, reveal the presence of oral tentacles on the manubrium of the newly-liberated medusa, thus confirming that *Bougainvillia flavida* Hartlaub is identical with it.

## INTRODUCTION

IN 1938, I published a partial revision of *Perigonimus* in so far as it affected the groundwork for a monograph of British medusae, later published by F. S. Russell (1953). The earlier revision facilitated the establishment of common names for both the hydroid and the medusa of British species, but did not indicate the position of many extra-territorial ones whose status needed to be clarified. In this revision the position of these remaining species is considered and the conclusions reached earlier for others are re-stated briefly.

Michael Sars (1846) described a new handsome hydroid from the Norwegian coast under the name *Perigonimus muscoides* and also gave a brief, but inadequate, description of the medusa which is liberated with four tentacles. Later Allman (1864a), in his revision of Bougainvillid and other hydroids, referred a number of them which could not be placed in *Bougainvillia* (because they did not produce Bougainvillid medusae) to this genus of Sars on the assumption that they were cogenetic. Thus *Perigonimus* came to represent a group of *Bougainvillia*-like hydroids, which, either did not give rise to *Bougainvillia* medusae or had fixed gonophores. Gradually the picture emerged that the medusae of most of these non-*Bougainvillia* species belonged to another family, the Pandeidae. Hartlaub (1897 and 1914) demonstrated that *Perigonimus repens* was the hydroid of "*Tiara pileata*", now known as *Leuckartiara octona* (Fleming), and that another Pandeid, *Halitholus cirratus* Hartlaub, also had a *Perigonimus* hydroid. More recently Rees & Russell (1937) were able to link the *Perigonimus serpens* kinds of hydroids with two species of medusae also of this family. Further revision of *Perigonimus* was

made possible by the discovery that the type species of *Perigonimus* gave rise to a *Bougainvillia* medusa (Rees, 1938). Consequently *Perigonimus* became a synonym of *Bougainvillia* and no longer available as a name for hydroids which could not be placed in the same genus or even the same family.

As *Amphinema* (i.e., *Stomotoca*) had already been established by Rees & Russell (1937) for the hydroids as well as the medusae of this genus, *Leuckartiara* (already re-established for the medusa phase) was adopted for the appropriate hydroids, and *Rhizorhagium* M. Sars re-established for non-medusa bearing species.

As already mentioned this left a number of "*Perigonimus*" species either not satisfactorily classified or left out of consideration, and, in the brief notes below, it has been thought desirable to indicate their present status and where possible to add new information.

## THE SPECIES WHICH HAVE BEEN REFERRED TO *PERIGONIMUS*.

### *Perigonimus abyssi* G. O. Sars

*Perigonimus abyssi* G.O. Sars, 1873, *Forh. Vidensk. Selsk. Krist.*, 1873 : 126, Tab. v, figs. 27-30.

The newly liberated medusa of this minute species becomes free with two opposite tentacles and two partly developed tentacles on the other perradial bulbs (Rees, 1938). It is a Pandeid and has been referred provisionally to *Leuckartiara* Hartlaub pending further knowledge of its possible relationship with medusae of the genera *Leuckartiara*, *Neoturris* or *Catablema*.

### *Perigonimus antarcticus* Hickson & Gravely

*Perigonimus antarcticus* Hickson & Gravely, 1907, *Nat. Antarct. Exped.*, 1901-1904, *Nat. Hist.*, 3 : 1, pl. i, figs. 1-3 ; pl. iv, fig. 32.

This species was placed in *Atractylis* (synonymous with *Bougainvillia*) by Vanhoffen (1910) and in a new genus *Gravelya* by Totton (1930), but its affinities lie with *Rhizorhagium* M. Sars, to which genus it was referred by Stechow (1919) and by Rees (1938). This last mentioned genus seems to be well constituted for simple Bougainvillid hydroids with fixed gonophores, but its relationship to *Aselomaris* Berrill and *Garveia* Wright will have to be considered in a wider revision of the Bougainvillidae.

### *Perigonimus apicatus* Brooks

*Perigonimus (Stomotoca) apicata* Brooks, 1884, *Zool. Anz.*, 7 : 711.

This is the name given by Brooks to the hydroid of *Stomotoca apicata*, now known as *Stomotoca dinema* (Péron & Lesueur). Mayer (1910, p. 113) referred this hydroid to *S. rugosa* Mayer, but the absence of an apical projection in the newly liberated medusa points to *S. dinema*, as does the name used by Brooks for his hydroid.

### *Perigonimus bitentaculatus* (Wright)

*Atractylis bitentaculata* Wright, 1867, *Proc. R. Phys. Soc. Edinb.*, 3 : 45, pl. i, fig. 5.

This species was referred provisionally to *Perigonimus* by Hincks (1868), but Wright himself gives the best clue as to the relationships of his species in the following

sentence: "They have the habit, like that of *Lar* (Gosse), of quickly and repeatedly bending down the body until the mouth is brought close to the surface on which the zoophyte grows."

This species has not been reported since it was found by Wright in a *Pecten* shell dredged from the Firth of Forth near Inch Keith. The characters of the hydranth with its two opposite tentacles strongly suggest that the hydroid is related to *Proboscidactyla* (*Lar* of Gosse) and should be placed in the same family. The possibility should not be overlooked that this species may prove to belong to *Pochella polynema* Hartlaub, the only other medusa of this family known to occur in British waters. I do not propose to create a new genus for this species, but merely note that its position appears to be in the family Proboscidactylidae of the Order Limmomedusae.

### *Perigonimus cidaritis* Weismann

*Perigonimus cidaritis* Weismann, 1883, *Entstehung der Sexualzellen bei den Hydromedusen*, Jena, p. 117, pl. xii, fig. 10-11.

This hydroid has a well-marked pseudohydrotheca in which the bases of the tentacles are protected in tube-like extensions of the perisarc as in *Bimeria* and *Thamnostoma*. As the medusa is a Bougainvillid closely related to *Thamnostoma russelli* Rees and there is very little difference in the hydroids, *P. cidaritis* has been referred to *Thamnostoma* by Rees (1938).

### *Perigonimus cirratus* Hartlaub

*Perigonimus cirratus* Hartlaub, 1914, *Nord. Plankt.*, Lief. 17, XII: 274, fig. 234.

Hartlaub (1914) gave the name *P. cirratus* to the hydroid of the medusa *Halitholus cirratus* which he described in the same memoir, presumably for the reason that it was then customary to adhere to a dual system of classification. There are now no legitimate reasons why the hydroid should not also take the name *Halitholus*.

### *Perigonimus coccineus* (Wright)

*Atractylis coccinea* Wright, 1861, *Ann. Mag. Nat. Hist.*, (3) 8: 130.

E. S. Russell (1907) is the only author who has reported this species since it was originally described by Wright. In 1938 I suggested that the species might prove to be identical with *Rhizorhagium roseum*.

### *Perigonimus confertus* (Alder)

*Eudendrium?* *confertum* Alder, 1856, *Trans. Tyneside Nat. Fld. Cl.*, 3: 103, pl. iii, figs. 5-8.

Allman (1859) placed this species in *Dicoryne* because of the peculiarities of the gonophores, an assessment which has been generally approved. Recently Vervoort (1946) used the name *Perigonimus confertus* for the first time for this species, although presumably aware that this name is synonymous with *Bougainvillia* and therefore no longer available. The name *Dicoryne conferta* has been the established name of this species since 1859 and I see no reason to change it.

***Perigonimus decorans* Schneider**

*Perigonimus decorans* Schneider, 1897, *Zool. Jb. Syst.*, **10** : 479.

Schneider's description is too inadequate even to indicate in what family this hydroid could be placed.

***Perigonimus formosus* Fewkes**

*Perigonimus formosus* Fewkes, 1889, *Bull. Essex Inst.*, **21** : 102, no figure.

Some small thumb-nail sketches of this species have been given by Fraser (1937, p. 35, pl. v, fig. 20) ; they indicate that *P. formosus* should be placed in *Rhizorhagium* M. Sars. A new description, especially of the gonophores, is much needed to determine the relationship of the species to *R. roseum*.

***Perigonimus gelatinosus* Duerden**

*Perigonimus gelatinosus* Duerden, 1895, *Sci. Proc. R. Dublin Soc.*, n.s., **8** : 325, 327, pl. xiv, figs. 2-3.

Duerden's species is not identifiable with certainty with any known British species, although there is a possibility that it is identical with *Leuckartiara octona* as supposed by Hartlaub (1914). The complete retraction of the hydranth within the pseudo-hydrotheca could be due to poor preservation and by itself is no indication of specific differences.

***Perigonimus georginae* Hadzi**

*Perigonimus georginae* Hadzi, 1913, *Rad. Jug. Akad. Znan. Umj.*, **200** : 98, figs. 7, 10 and 11.

The original description by Hadzi is not very satisfactory. He appears to have confused at least two species. His figure 7 is a *Stomatoca* hydroid, his figure 8 represents a *Bougainvillia*, and the newly liberated medusa, although combining some of the features of two species of *Stomatoca* medusae, cannot be referred with certainty to either *S. rugosa* Mayer or to *S. dinema* (Péron & Lesueur). Until the Adriatic medusae have been re-investigated it seems preferable to let this species retain its identity as *Stomatoca georginae*. The name *Dinema* applied by Hadzi to the medusa is a synonym of *Leuckartiara*, a member of a different sub-family.

***Perigonimus* (?) *inflatus* Duerden**

*Perigonimus* (?) *inflatus* Duerden, 1895, *Sci. Proc. R. Dublin Soc.*, n.s., **8** : 329, pl. xiv, fig. 4.

This little known species does not seem to have been reported since Duerden's original description. It is here referred provisionally to *Rhizorhagium* M. Sars.

***Perigonimus jonesii* Osborn & Hargitt**

*Perigonimus jonesii* Osborn & Hargitt, 1894, *Amer. Nat.*, **28** : 27, figs. 1-12.

I have followed Hartlaub (1914) in placing this species in the synonymy of *Leuckartiara octona* (Fleming). The colony described by Osborn & Hargitt compares favourably with those found on *Scaphander lignarius* in British waters.



***Perigonimus linearis* (Alder)**

*Atractylis linearis* Alder, 1862, *Trans. Tyneside Nat. Fld. Cl.*, 5 : 230, pl. x, figs. 1-3.

Alder's *Atractylis linearis* was tentatively referred to *Perigonimus* by Allman (1864a). The newly liberated medusa has a very thick jelly and a small subumbrellar cavity, and in this it resembles *Bougainvillia flavida* Hartlaub (1897), an opinion later expressed by Hartlaub himself (1911). The published drawings of Alder do not suggest any oral tentacles on the manubrium of the medusa, but fortunately his original drawings (from which the engraving for his paper (1862, pl. x, figs. 2 and 3) was prepared) are preserved in the British Museum (Nat. Hist.), having been acquired by Canon A. M. Norman and later bequeathed by him. These drawings do show the oral tentacles faintly and so the two species can be regarded as identical.

Russell (1953) does not venture an opinion on the status of *P. linearis* or its medusa, but suggests that *B. flavida* may prove to be the hydroid of *Bougainvillia britannica*. Until this relationship can be demonstrated I propose to retain Alder's species under the name *Bougainvillia linearis* (Alder, 1862).

***Perigonimus maclovianus* (Lesson)**

*Perigonimus maclovianus* Vanhoffen, 1910, *Dtsch. Südpolar-Exped.*, 11 : 272, fig. 10a-d (hydroid).

The medusa of this species was described under the name *Cyanaea bougainvillii* by Lesson (1830), who later made it the type species of *Bougainvillia* under the name *B. macloviana* (1836). This is the name in common use to-day for both hydroid and medusa, although Vanhoffen (1910), who first described the hydroid, referred it to *Perigonimus*. Both Stechow (1919, p. 21) and Kramp (1928, p. 50) pointed out that *Bougainvillia* was the correct generic name for both hydroid and medusa.

***Perigonimus minutus* Allman**

*Perigonimus minutus* Allman, 1863, *Ann. Mag. Nat. Hist.*, (3), 11 : 11.

Allman's *Perigonimus minutus* has been referred to *Leuckartiara octona* both by Hartlaub (1914) and Rees (1938). Allman's description and figures (1871-2, pl. xi, figs. 4-6) correspond closely with the slender polyps such as are commonly found on *Scaphander lignarius* (Rees, 1938, p. 14 fig. 3d-f).

***Perigonimus miniatus* (Wright)**

*Atractylis miniata* Wright, 1863, *Proc. R. Phys. Soc. Edinb.*, 2 : 351.

Wright's *Atractylis miniata* was referred provisionally to *Perigonimus* by Hincks (1868). The reproduction of the species is not known, but the description suggests that Wright was describing a colony of *Rhizorhagium* and *R. roseum* in particular.

***Perigonimus multicornis* Allman**

*Perigonimus multicornis* Allman, 1874, *Nature, Lond.*, 11 : 179.

A re-examination of Allman's type material in the Zoological Museum, Copenhagen by Kramp (1926) revealed that the species was *Eudendrium ramosum*.

***Perigonimus muscoides* M. Sars**

*Perigonimus muscoides* M. Sars, 1846, *Fauna Littoralis Norvegiae*, Heft. 1 : 8, Tab. 1, figs. 19-21.

This is the type species of *Perigonimus* and the elucidation of its life history by Rees (1938, p. 2) revealed that its medusa was a *Bougainvillia*, *B. nordgaardi* (Browne, 1903). *Perigonimus* M. Sars, 1846, thus falls into the synonymy of *Bougainvillia* Lesson 1836 and the name *Bougainvillia muscoides* becomes applicable to both hydroid and medusa as demonstrated in the above paper.

***Perigonimus muscus* Allman**

*Perigonimus muscus* Allman, 1863; *Ann. Mag. Nat. Hist.* (3), 11 : 12.

This species was referred to *Bougainvillia* by Allman (1864a). It was considered to be synonymous with *Bougainvillia ramosa* by Hartlaub (1911) and this view was confirmed by the studies of Brink (1925) who demonstrated that colonies passed through a *muscus* stage when young before reaching the stage typified by the usual *ramosa* kind of colony.

***Perigonimus* (?) *nanellus* Stechow**

*Perigonimus* (?) *nanellus* Stechow, 1919, *Zool. Jb. Syst.*, 42 : 14, fig. C.

I consider this species to be a *Bougainvillia*, possibly representing a well formed colony of one of the common species, and pending further knowledge of its life history it is now referred to this genus as *B. nanellus*.

***Perigonimus napolitanus* Hargitt**

*Perigonimus napolitanus* Hargitt, 1904, *Mitt. zool. Sta. Neapel*, 16 : 571, taf. 22, fig. 25.

This species is not recognizable.

***Perigonimus nudus* Stechow**

*Perigonimus nudus* Stechow, 1919, *Zool. Jb. Syst.*, 42 : 16, fig. D.

The form of the hydranth as noted by Stechow resembles those of the medusa-bearing Campanopsinae of the family Haleciidae and the relationships of the species undoubtedly lie with this group rather than with any Athecate (Anthomedusan) group.

***Perigonimus* ? *nutans* Hincks**

*Perigonimus* (?) *nutans* Hincks, 1877, *Ann. Mag. Nat. Hist.*, (4), 19 : 149, pl. xii, fig. 1.

Rees & Russell (1937, p. 71) regard this species as possibly a young polyp of the *Perigonimus serpens* type; this kind of hydroid belongs to the genus *Amphinema*. There are two species in British waters, *A. dinema* and *A. rugosum*, and these are so alike that it is not possible to assign this species to one or the other.

***Perigonimus palliatus* (Wright)**

*Attractylis palliata*, Wright, 1861, *Ann. Mag. Nat. Hist.* (3), 8 : 129, pl. iv, figs. 6 and 7.

In this species the pseudohydrotheca is large and dilated, but I do not think it has any special significance as a diagnostic character. The medusa, according to Wright

(1861) " resemble exactly those of *Atractylis* (*Perigonimus*) *repens* ", that is, *Leuckartiara octona* (Fleming). Wright's colony was on a shell inhabited by a hermit crab *Eupagurus bernhardus* and the size of the pseudohydrotheca can be attributed to habitat and feeding conditions as in the other colonies of *Leuckartiara octona* living under similar conditions (see Rees, 1938, p. 16, fig. 5). I regard the two species as identical.

### *Perigonimus pugetensis* Heath

*Perigonimus pugetensis* Heath, 1910, *Biol. Bull. Woods Hole*, **19**: 74, figs. 1 and 2.

This small hydroid was found growing on a fish, *Hypsagonus quadricornis* (C. & V.); it was found that its newly liberated medusa was a Pandeid like *Leuckartiara octona*.

Hartlaub (1914) doubted whether the species was distinct from *L. octona*, and the latter has since proved to be a cosmopolitan species. Rees (1938) found a colony of *L. octona* growing on a fish, *Agonus cataphractus*, and this colony compared very favourably with that of Heath. It is now proposed to regard *P. pugetensis* as a synonym of *L. octona*.

### *Perigonimus pusillus* (Wright)

*Eudendrium pusillum* Wright, 1857, *Edinb. New Phil. J.*, n.s., **6**: 84, pl. ii, fig. 8, 9.

Stechow (1919) revived the name *pusillus* for the better known name *Perigonimus repens* (Wright, 1858). It appears that Wright changed the name of his species to *repens* on the receipt of a paper by M. Sars (1857) in which he described a species of *Halécium* under the name *Eudendrium pusillum*.

Wright's species falls into the synonymy of *Leuckartiara octona* (Fleming).

### *Perigonimus quadritentaculatus* (Wright)

*Atractylis quadritentaculata* Wright, 1867, *Proc. R. Phys. Soc. Edinb.* **3**: 45, pl. i, fig. 6.

This creeping form with long stolons and sessile, four tentacled hydranth is possibly a juvenile Bougainvillid, which cannot be identified with certainty with any particular species.

### ? *Perigonimus robustus* Fraser

? *Perigonimus robustus* Fraser, 1938, *Rep. Hancock Pacific Exped.*, **4**, No. 1; 17, pl. iii, fig. 12.

In the absence of information on the gonophore this species cannot be satisfactorily classified, and is therefore provisionally placed in *Bougainvillia*.

### *Perigonimus roseus* (M. Sars)

*Rhizorhagium roseum* M. Sars, 1877, *Fauna Littoralis Norvegiae*, Heft **3**: 28, Tab. ii, figs. 37-43.

The genus *Rhizorhagium* was created for this species by Sars, and although the type species was referred for a time to *Perigonimus* by Bonnevie (1899) and others, the genus was re-instated by Rees (1938).

### *Perigonimus sarsii* Bonnevie

*Perigonimus sarsii* Bonnevie, 1901, *Bergens Mus. Meeresfauna von Bergen*, Heft I, p. 6.

This species has been referred to *Rhizorhagium* by Rees (1938) and there is a distinct possibility that the species is founded on a colony of *R. roseum*, growing over the stems of another hydroid.

***Perigonimus schneideri* Motz-Kossowska**

*Perigonimus schneideri* Motz-Kossowska, 1905, *Arch. Zool. exp. gén.*, (4), 3: 72, fig. VI.

Stechow (1922) created a new genus *Perarella* for this species and indicated that its position was not in the Hydractinidae but rather in the Bougainvillinae near *Atractylis*.

Since then Komai (1931) has described the hydroid of the medusa *Cytaeis japonica*, to which the present species is clearly related. Both species have the following features in common: a reticulate anastomosing network of stolons, a short collar round the base of the hydranth, the hydranth itself long and tubular, of the *Podocoryne* type, and the gonophores borne singly on the hydrorhiza.

I propose to retain *Perarella* for Cytaeid hydroids in which there are fixed gonophores and to place the genus in the family Cytaeidae, L. Agassiz, 1862. Agassiz's definition excludes unrelated forms such as *Podocoryne* (including *Lynnorea*), *Turritopsis* and *Oceania*, which Uchida (1927) and others have placed in the family.

While possessing distinct oral *tentacles* on the manubrium of the medusa as in the Bougainvillidae, the presence of simple perradial tentacles together with the characters of the hydroid justify the existence of a separate family for *Cytaeis* and *Perarella*—a family in which the combined characters of hydroid and medusa present some characters in common with both the Hydractinidae and the Bougainvillidae, but none of their specialized features.

***Perigonimus serpens* Allman**

*Perigonimus serpens* Allman, 1863, *Ann. Mag. Nat. Hist.* (3), 11: 10.

Rees and Russell (1937) have referred this species to *Amphinema dinema* following the elucidation of the life history of this medusa and its hydroid. Allman (1871-2) clearly indicated in his illustrations of the medusa that he was dealing with this species and not with the closely related *A. rugosum*.

***Perigonimus sessilis* (Wright)**

*Eudendrium sessile* Wright, 1857, *Edinb. New Phil. J.*, N.S., 6: 90, pl. iii, figs. 16-17.

This is the sessile form of *Leuckartiara octona* (Fleming). When the colony is growing on an uneven, constantly abraded surface the hydranths remain sessile in protected hollows or grooves and do not progress beyond the *sessilis* stage (Rees, 1938).

***Perigonimus steinachi* Jickeli**

*Perigonimus steinachi* Jickeli, 1883, *Gegenbaurs Jb.*, 8: 617, pl. 27, figs. 1-9.

Jickeli gives a totally inadequate description of the morphology of his hydroid (although he discusses its histology at length) and it is not possible to indicate what it might be.

***Perigonimus sulfureus* Chun**

*Perigonimus sulfureus* Chun, 1889, *S. B. Akad. Wiss. Berlin*, 1889 (2): 524.

Stechow (1921 and 1923) created a new genus *Perigonella* for this species and placed it with the Hydractinians near *Stylactella*. Steche (1906) figures a well-developed



medusa bud with conical bulbs with tentacles and manubrium devoid of oral tentacles, but we have insufficient information to assign this species to a family.

### *Perigonimus vagans* Thornely

*Perigonimus vagans* Thornely, 1908, *J. Linn. Soc. Zool.*, **31**: 81, pl. ix, fig. 1.

This species is now referred provisionally to *Bougainvillia* pending the re-discovery of the hydroid. Thornely's description is insufficient to permit any other suggestions.

### *Perigonimus vestitus* Allman

*Perigonimus vestitus* Allman, 1864b, *Ann. Mag. Nat. Hist.*, Ser. (3), **14**: 57.

In 1846 Allman described a new *Perigonimus*, *P. vestitus* from the Firth of Forth, in which, to quote his 1872 diagnosis the "posterior part of the body [of the hydranth], invested by the rough perisarc, which is thence continued as a delicate, smooth membrane over the remainder of the body nearly as far as the mouth". His figures (1871, pl. xi, figs. 1-3) show the pseudohydrotheca (that is the perisarc investment of the hydranth) to extend anteriorly beyond the tentacles close to the mouth. There is no suggestion that this perisarc is perforated to allow the tentacles to project (as they do) and no suggestion of any tubular perisarc sheathing encircling the base of any tentacle. This seems to be one of the few occasions on which this far-sighted pioneer of hydroid systematics failed to make a satisfactory description.

Stechow (1919) referred *P. vestitus* to the medusa genus *Cytaeis* presumably on an assumed relationship between the hydroid and medusa of *vestitus* with *Perigonimus cidaritis*. There were no real grounds for this, as the figures demonstrate that *P. vestitus* gives rise to a typical Pandeid medusa, so that it must be stated that the species is related to genera like *Leuckartiara*, *Amphinema* and *Halitholus*.

In *Perigonimus vestitus* too, the bases of the tentacles are not enclosed in perisarc tubes extending from the pseudohydrotheca itself. Such a feature is characteristic of *Bimeria*, *Thamnitis* and *Thamnostoma*, and the medusa of the latter clearly has affinities with the Bougainvillidae rather than the Pandeidae. *Cytaeis*, which Stechow erroneously associated with these Bimerid hydroids, belongs to none of these families.

Hartlaub (1914) in his revision of the Tiaridae had listed *Perigonimus vestitus* under the synonymy of *Leuckartiara octona*, but I was reluctant to follow him in my study of variation in the hydroid of this species (1938) in view of the diagnosis given by Allman. Fortunately, material of *Perigonimus vestitus* determined by Allman, growing on *Lepidochiton cinereus*, has recently been found in the collections of the British Museum (B.M. No. 1877.4.12.31).

A re-examination reveals that although the soft parts have disappeared the chitonous perisarc of the stems and pseudohydrothecae are still present. The latter are very similar in appearance to those that I described for a colony of *Leuckartiara octona* (Fleming) on *Corystes cassivelaunus* (Rees, 1938, p. 16, fig. 5). There is no suggestion of any perisarc sheaths such as are found in *Bimeria*. The colonies exhibit no features that could not be found in a well-developed colony of *Leuckartiara octona*, and the characters of the medusa, as described by Allman, support this. For

these reasons the species *vestitus* is placed in the synonymy of *Leuckartiara octona* (Fleming).

***Perigonimus yoldiae-arcticae* Birula**

*Perigonimus yoldiae-arcticae* Birula, 1897, *Annu. Mus. Zool. Acad. St. Petersb.* 2: 86, pl. x, fig. 3.

Jäderholm (1909) gives an excellent figure of this hydroid. I have examined material from the following localities:

*Zoologiske Museum, Copenhagen.*

Kandalakscha, on *Yoldia arctica*, 24 fm. (from St. Petersburg Museum).

*Riksmuseum, Stockholm.*

Kandalakscha, 21–27 fm. Coll. N. Knipowitsch (from St. Petersburg Museum).

Kandalakscha, 20–25 fm. Coll. A. Birula (from St. Petersburg Museum).

Nordenskiöld's Sea, 77° 1' N., 114° 35' E., 3.ix.1901 (Russian Polar Expedition, 1900–1903, St. 46).

Nordenskiöld's Sea, 75° 42' N., 124° 41' E., 6.ix.1901 (Russian Polar Expedition, 1900–1903).

East Greenland, Franz-Josef Fjord (Muskoxfjord), 21.viii.1900, 220 m. (Swedish zoological Polar Expedition, 1900, St. 27).

All the material from the above localities is sterile. The pseudohydrotheca of the hydranth reaches almost to the tentacles, and in one hydranth it is a little loose-fitting and wrinkled which permits its limits to be seen. There is no indication of a web between the tentacles.

The most interesting (and also the characteristic) feature of this hydroid is the formation of 'nodes' on the stems, and if we accept the belief that the species is a gymnoblastic hydroid (as seems most likely), these "nodes" indicate points of regeneration after periodic dying down of the hydranths. The species is referred provisionally to *Bougainvillia*.

SYNOPSIS OF THE STATUS OF THE DIFFERENT SPECIES  
OF "PERIGONIMUS"

Order ATHECATA (ANTHOMEDUSAE)

Family CYTAEIDAE

Genus *Perarella* Stechow  
*Perarella schneideri*

(Original name)  
*Perigonimus schneideri* Motz-Kossowska

Family BOUGAINVILLIDAE

Sub-family THAMNOSTOMINAE

Genus *Thamnostoma* Haeckel  
*Thamnostoma cidaritis*

*Perigonimus cidaritis* Weismann

Sub-family BOUGAINVILLINAE

Genus *Bougainvillia* Lesson  
*Bougainvillia macloviana*  
*Bougainvillia muscoides*  
*Bougainvillia ramosa*  
*Bougainvillia linearis*

*Perigonimus macloviana* Vanhoffen  
*Perigonimus muscoides* M. Sars  
*Perigonimus muscus* Allman  
*Atractylis linearis* Alder

Provisionally also:

*Bougainvillia nanellus*  
*Bougainvillia robusta*  
*Bougainvillia vagans*  
*Bougainvillia yoldiae-arcticae*  
*Bougainvillia* sp.

Genus *Dicoryne* Allman*Dicoryne conferta*Genus *Rhizorhagium* M. Sars*Rhizorhagium roseum**Rhizorhagium antarcticum**Rhizorhagium formosum*

*Perigonimus* (?) *nanellus* Stechow  
*Perigonimus robustus* Fraser  
*Perigonimus vagans* Thornely  
*Perigonimus yoldiae-arcticae* Birula  
*Atractylis quadritentaculata* Wright

*Eudendrium confertum* Alder*Rhizorhagium roseum* M. Sars*Perigonimus sarsii* Bonnevie? *Atractylis coccinea* Wright? *Atractylis miniata* Wright? *Perigonimus inflatus* Duerden*Perigonimus antarcticus* Hickson & Gravely*Perigonimus formosus* Fewkes

Family PANDEIDAE

Sub-family STOMOTOCINAE

Genus *Stomotoca* L. Agassiz*Stomotoca dinema**Stomotoca georginae*

Sub-family PANDEINAE

Genus *Leuckartiara* Hartlaub*Leuckartiara octona**Perigonimus serpens* Allman*Perigonimus* (?) *nutans* Hincks*Perigonimus apicatus* Brooks*Perigonimus georginae* Hadzi*Eudendrium pusillum* Wright*Eudendrium sessile* Wright*Eudendrium repens**Atractylis palliata* Wright*Perigonimus minutus* Allman*Perigonimus vestitus* Allman*Perigonimus jonesii* Osborn & Hargitt*Perigonimus pugetensis* Heath? *Perigonimus gelatinosus* Duerden

Provisionally also :

*Leuckartiara abyssi*Genus *Halitholus* Hartlaub*Halitholus cirratus**Perigonimus abyssi* G. O. Sars*Perigonimus cirratus* Hartlaub

Family EUDENDRIIDAE

Genus *Eudendrium* Ehrenberg*Eudendrium ramosum**Perigonimus multicornis* Allman

## Order THECATA (LEPTOMEDUSAE)

Family HALECIIIDAE

Sub-family CAMPANOPSINAE

*Perigonimus nudus* Stechow

## Order LIMNOMEDUSAE

Family PROBOSCIDACTYLIDAE

Genus *Pochella* Hartlaub? *Pochella polynema**Atractylis bitentaculata* Wright

## INCERTAE SEDIS

- Perigonimus decorans* Schneider  
*Perigonimus napolitanus* Hargitt  
*Perigonimus steinachi* Jickeli  
*Perigonella sulphureus* (*Perigonimus sulphureus* Chun)

These few species which I have been unable to classify are insufficiently described.

The above classification is in accord with recent progress, but some of it may not be familiar to specialists who work only on hydroids and leave the medusa phase out of consideration. I believe with Allman (1864*a*) that "An adequate conception of the hydroid can thus only be obtained by regarding it as the product of two factors, one of them finding its expression in the trophosome, and the other in the gonosome". The result is frequently a mosaic, a blending of characteristics into a pattern which gives a much better picture of the position of the living species than does consideration of only a part of the life history.<sup>1</sup>

Much has been written by Kramp (1941 and 1949) about the dangers of attempting a single classification for hydroids and medusae, but its outlines are already apparent for the Anthomedusae, and this revision of *Perigonimus* is intended as a contribution towards it.

## REFERENCES

- AGASSIZ, L. 1862. *Contributions to the Natural History of the United States of America*, 4 1-380, pl. xx-xxxiv.
- ALDER, J. 1856. A Catalogue of the Zoophytes of Northumberland. *Trans. Tyneside Nat. Fld. Cl.*, 3 : 93-162 ; pls. iii-x.
- 1862. Supplement to a Catalogue of the Zoophytes of Northumberland and Durham: *Trans. Tyneside Nat. Fld. Cl.*, 5 : 225-247.
- ALLMAN, G. J. 1859. Notes on the British Zoophytes. *Ann. Mag. Nat. Hist.* (3), 4 : 367-370.
- 1863. Notes on the Hydroida. *Ann. Mag. Nat. Hist.* (3), 11 : 1-12.
- 1864*a*. On the construction and limitation of genera among the Hydroida. *Ann. Mag. Nat. Hist.* (3), 13 : 345-380.
- 1864*b*. Notes on the Hydroida. *Ann. Mag. Nat. Hist.* (3), 14 : 57-64.
- 1871-72. *A monograph of the Gymnoblasic or Tubularian Hydroids*. xxiv + 450 pp. London.
- 1874. On the diagnosis of new genera and species of Hydroids. *Nature, Lond.*, 11 : 179.
- BIRULA, A. 1897. Recherches sur la biologie et la zoogéographie principalement des mers russes. 2. Hydrozoaires, Polychètes et Crustacés recueillis par le Dr. A. Botkine en 1895 dans les Golfes du Jenisei et de l'Obi. *Annu. Mus. zool. Acad. Sci. St.-Petersb.*, 2 : 78-116.
- BONNEVIE, K. 1899. Hydroida. *Den Norske Nordhavs-Expedition 1876-1878*, 26 : Zoology, 104 pp.
- 1901. Hydroiden. *Bergens Museum Meeresfauna von Bergen*, 1 : 1-15.
- BRINK, R. 1925. Notes concerning the variability and the action of environmental influences on the structure and growth of the hydroid-colony *Bougainvillia ramosa* (v. Ben.) Lesson and its bearings on systematics. *Proc. Akad. Sci. Amst.*, 27 : 726-733.
- BROOKS, W. K. 1884. On the life history of *Eutima*, and on radial and bilateral symmetry in Hydroids. *Zool. Anz.*, 7 : 709-711.

<sup>1</sup>Basic principles in the classification of hydroids and medusae will be considered in another paper.



- BROWNE, E. T. 1903. Report on some Medusae from Norway and Spitzbergen. *Bergens Mus. Årb.* No. 4 : 1-36.
- CHUN, C. 1889. Berichte über eine nach den Canarischen Inseln im Winter 1887-88 ausgeführte Reise. II Beobachtungen über die pelagische Tiefen- und Oberflächenfauna des östlichen Atlantischen Oceans. *S-B. preuss. Akad. Wiss.*, 1889 : 519-553.
- DUERDEN, J. E. 1895. Notes on the Hydroida and Polyzoa. Ex. Survey of fishing grounds, west coast of Ireland 1890-91. *Sci. Proc. R. Dublin Soc. (N.S.)*, 8 : 325-336.
- FEWKES, J. W. 1889. New Invertebrata from the coast of California. *Bull. Essex Inst.* 21 : 99-146.
- FRASER, C. M. 1937. *Hydroids of the Pacific Coast of Canada and the United States.* Toronto. Pp. 1-207, pl. I-XLIV.
- 1938. Hydroids of the 1934 Allen Hancock Pacific Exp. *Rep. Hancock Pacific Exped.* 4 : 1-105.
- HADZI, J. 1913. Poredbena hidroidska istrazivanja II. *Perigonimus corii* sp. n. i *Perigonimus georginae* sp. n. *Rad. Jug. Znan. Umj. Akad.* 200 : 89-108, 11 text-figs.
- HARGITT, C. W. 1904. Notes on some Hydromedusae from the Bay of Naples. *Mitt. zool. Sta. Neapel*, 16 : 553-585.
- HARTLAUB, C. 1897. Die Hydromedusen Helgolands. *Wiss Meeresuntersuch.*, N.F. Bd. II, Abt. Helgoland, Heft. I, X : 449-512.
- 1911. *Nord. Plankt.* Lief. 15, XII. Craspedote Medusen, Tiel 1, Lief. 2, Familie III, Margelidae : 137-236.
- 1914. *Nord. Plankt.* Lief. 17, XII. Craspedote Medusen, Tiel 1, Lief. 3, Familie IV, Tiaridae : 237-363.
- HEATH, H. 1910. The association of a Fish with a Hydroid. *Biol. Bull. Woods Hole*, 19 : 73-78.
- HICKSON, S. J. and GRAVELY, F. H. 1907. Hydroid Zoophytes. *Nat. Antarct. Exped.* 1901-1904, *Nat. Hist.* 3 : 1-34.
- HINCKS, T. 1868. *A History of the British Hydroid Zoophytes.* London : pp. lxxviii + 338, 1 pl. ; Atlas, 67 pls.
- 1877. Contributions to the history of the Hydroida. *Ann. Mag. Nat. Hist. (4)*, 19 : 148-152.
- JÄDERHOLM, E. 1909. Northern and Arctic Invertebrates in the collection of the Swedish State Museum (Riksmuseum). IV. Hydroiden. *K. Svenska Vetensk. Akad. Handl.* 45 No. 1, 124 pp
- JICKELI, C. F. 1883. Der Bau der Hydroidpolyphen. *Gegenbaurs Jb.* 8 : 580-680.
- KOMAI, T. 1931. On the hydroid stage of *Cytaeis japonica* Uchida. *Annot. zool. jap.* 13 : 255-258.
- KRAMP, P. L. 1926. Occasional notes on Coelenterata. 1 : A. The type specimens of "*Perigonimus multicornis*" and "*Eudendrium rigidum*" Allman. B. *Eucheilota maculata* and *Campanulina hincksii* Hartlaub. c. *Cylocamma welshi* Bigelow. *Vidensk. Medd. naturh. Foren. Kbh.* 82 : 241-247.
- 1928. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-16. XLIII. Hydromedusae, I. Anthomedusae. *Vidensk. Medd. naturh. Foren. Kbh.*, 85 : 27-64, figs. 1-30.
- 1941. Notes on the hydroid *Campanulina panicula* G. O. Sars. *Goteborgs Vetensk. Samh. Handl.* (6) ser. B 1, No. 2 ; 1-11.
- 1949. Origin of the hydroid family Corymorphidae. *Vidensk. Medd. Dansk. naturh. Foren. Kbh.* 111 : 183-215.
- LESSON, R. P. 1830. Zoophytes. *Voyage autour du monde execute ... sur La Coquille par M. L.-J. Duperry. Zoologie par M. Lesson.* 2 vol. Paris 1826-30 (Vol. 2, P.2, 2e division, 1830).
- 1836. Mémoire sur la famille des *Beroides* (Beroidae Less.). *Ann. sci. nat. (Zool.)* (2) Vol. 5, pp. 235-266.
- MAYER, A. G. 1910. Medusae of the World. Vol. 1. *Publ. Carneg. Instn.* 109 : 1-230.

- MOTZ-KOSSOWSKA, S. 1905. Contribution a la connaissance des Hydraires de la Méditerranée occidentale. I. Hydraires gymnoblastiques. *Arch. Zool. exp. gén.* (4) **3**: 33-98.
- OSBORN, H. L. & HARGITT, C. W. 1894. *Perigonimus Jonesii*; a Hydroid supposed to be new, from Cold Spring Harbor, Long Island. *Amer. Nat.* **28**: 27-34.
- REES, W. J. 1938. Observations on British and Norwegian hydroids and their medusae. *J. Mar. biol. Ass. U.K.*, **23**: 1-42.
- REES, W. J. & RUSSELL, F. S. 1937. On rearing the hydroids of certain medusae, with an account of the methods used. *J. Mar. biol. Ass. U.K.* **22**: 61-82.
- RUSSELL, E. S. 1907. The *Atractylis coccinea* of T. S. Wright. *Ann. Mag. Nat. Hist.* (7), **20**: 52-55.
- RUSSELL, F. S. 1953. *The Medusae of the British Isles: Anthomedusae, Leptomedusae, Limnomedusae, Trachymedusae and Narcomedusae*. Cambridge: pp xii + 530, text-figs. 1-319 and Pls. I-XXXV.
- SARS, G. O. 1873. Bidrag til Kundskaben om Norges Hydroider. *Forh. Vidensk.-Selsk. Krist.* **1872**: 91-150, Tab. II-V.
- SARS, M. 1846. *Fauna Littoralis Norvegiae*, Heft **1**: 1-94. Christiania.
- 1857. Bidrag til Kundskaben om Middelhavets Littoral-Fauna, Reisebemaerkninger fra Italien. *Nyt. Mag. Naturv.* **9**: 110-164.
- 1877. New and little known Coelenterates. *Fauna Littoralis Norvegiae*, Heft **3**: 1-32.
- SCHNEIDER, K. C. 1897. Hydropolyten von Rovigno, nebst Uebersicht über das system der Hydropolyten im allgemeinen. *Zool. Jb. (Syst.)* **10**: 472-555.
- STECHE, O. 1906. Bemerkungen über pelagische Hydroiden kolonien. *Zool. Anz.* **31**: 30-32.
- STECHOW, E. 1919. Zur Kenntnis der Hydroidenfauna des Mittelmeeres, Amerikas und anderer Gebiete, nebst Angaben über einige Kirchenpauer'sche Typen von Plumulariden. *Zool. Jb. (Syst.)* **42**: 1-172.
- 1921. Neue Genera und Species von Hydrozoen und anderen Evertebraten. *Arch. Naturgesch.* **87**. A<sub>3</sub>: 248-265.
- 1922. Zur Systematik der Hydrozoen, Stromatoporen, Siphonophoren, Anthozoen und Ctenophoren. *Arch. Naturgesch.*, **88**, A<sub>3</sub>: 141-155.
- 1923. Zur Kenntnis der Hydroidenfauna des Mittelmeeres, Amerikas und anderer Gebiete. II. Tiel. *Zool. Jb. (Syst.)* **47**: 29-270.
- THORNELLY, L. R. 1908. Reports on the marine biology of the Sudanese Red Sea. X. Hydroida collected by Mr. C. Crossland from October 1904 to May, 1905. *J. Linn. Soc. Zool.*, **31**: 80-85.
- TORREY, H. B. 1902. The Hydroida of the Pacific coast of North America. *Univ. Calif. Publ. Zool.* **1**: 1-104.
- TOTTON, A. K. 1930. Coelenterata. Part V. Hydroida. *Brit. Antarct. (Terra Nova) Exped.* 1910, *Zool.* **5**: 131-252.
- UCHIDA, T. 1927. Studies on Japanese Hydromedusae. I. Anthomedusae. *J. Fac. Sci. Tokyo Univ.* **1**: 145-238.
- VANHOFFEN, E. 1910. Die Hydroiden der deutschen Südpolar-Expedition 1901-1903. *Dtsch. Südpol. Exped.*, **11**, *Zool.* **3**: 269-340.
- VERVOORT, W. 1946. Hydrozoa (C.I). A. Hydropolyten. *Fauna van Nederland*, **14**: 1-336.
- WEISMANN, F. L. A. 1883. *Die Entstehung der Sexualzellen bei den Hydromedusen. Zugleich ein Beitrag zur Kenntnis des Baues und der Lebenserscheinungen dieser Gruppe*. Jena: pp. xiii + 295, 24 pls.
- WRIGHT, T. S. 1857. Observations on British Zoophytes. *Edin. New Phil. J.*, n.s., **6**: 79-90.
- 1858. Observations on British Zoophytes. *Proc. R. phys. Soc. Edinb.*, **1**: 447-455.
- 1861. Observations on British Protozoa and Zoophytes. *Ann. Mag. Nat. Hist.* (3) **8**: 120-135.
- 1867. Observations on British Zoophytes . . . *Proc. R. phys. Soc. Edinb.* **3**: 42-46.